



Ekrem Akdeniz, Mustafa Suat Bolat, Sevdâ Akdeniz
Department of Urology and Department of Anesthesiology and Reanimation, Samsun Training and Research Hospital, Samsun, Türkiye

Özet

Ağrı, hastaların cerrahiden sonra en çok şikayet ettiği semptomlardan biridir. Post-operatif ağrı; doku hasarı, cerrahi sonrası yerleştirilen drenler ve cerrahi komplikasyonlar nedeniyle oluşabilir. Yeterli tedavi edilmeyen post-operatif ağrı, morbidite ve mortalitenin artmasına, solunumsal ve tromboembolik komplikasyonların oluşmasına, hastanede kalış süresinin uzamasına ve kronik ağrı oluşma riskinin artmasına sebep olmaktadır. Ağrı tedavisi hasta konforunu etkileyen önemli faktördür. Bu nedenle tedaviden sorumlu doktorların ağrı tedavisinde yeterli bilgi ve deneyime sahip olması gereklidir.

Anahtar Kelimeler

Ağrı Tedavisi; Post-Operatif Ağrı; Üroloji

Abstract

Pain is the most complaint symptom of patients in post-operative period. Main causes of post-operative pain are tissue damage, drainage apparatus and surgical complications due to surgery. Inadequate post-operative pain management may cause increase in morbidity, mortality, hospitalization stay, respiratory and thromboembolic complications, risk of developing chronic pain and decrease in quality of life. Pain management is synonymous with patient comfort. Therefore, clinicians responsible for the treatment of pain management should have sufficient knowledge and experience.

Keywords

Pain; Post-Operative Pain; Urology

Introduction

Approximately three fourths of postoperative patients complain from pain [1]. Post-operative pain generally occurs due to tissue damage, indwelling drains due to surgery, and post-operative complications [2,3]. Moderate to severe pain occurs in approximately 70% of patients who had surgery [4]. Despite many drugs, technical and invasive interventions post-operative pain can't be eliminated [5]. At postoperative period proportion of patients who had moderate or severe pain during first two weeks of postoperative period was 58% in hospitalized patients and 75% in discharged patients [6]. Post-operative pain decreases patient comfort by its effects on respiratory, cardiovascular, endocrine, immune, gastrointestinal, and locomotor systems; it is a serious problem that increase development of chronic pain, morbidity, and even mortality [5].

Surgical incision stimulates systemic neuroendocrine, and local inflammatory responses. Thus, stimulus is transmitted through pain pathways to dorsal horn of the spinal cord and brain and it is perceived. Repeated stimuli due to tissue damage cause chronic post-operative pain syndrome in later period [6].

Post-operative pain is closely related with patient's health. The aim of post-operative pain should be to increase comfort, satisfaction, and functional abilities and to decrease morbidity, hospital stay, and delay to return to normal daily activities of the patient [6]. Insufficiently treated post-operative pain may cause decline in patient's health and increase in healthcare costs. Therefore, clinicians responsible from management of these patients should have sufficient knowledge and experience on this topic.

Evaluation and Assessment of Pain

Approach to patients with pain and its evaluation are important for treatment of patients with post-operative pain. A detailed evaluation is very important. Various subjective and objective parameters have been used to evaluate both pain at baseline and pain after treatment. Although various parameters have been used to evaluate pain, the most common method is Visual Analog Scale (VAS). VAS is a simple and useful method. 'No pain' is written to one end of a 10 cm ruler, 'the most severe pain' is written to the other end and the patient is asked to locate his pain on this ruler (Figure 1).

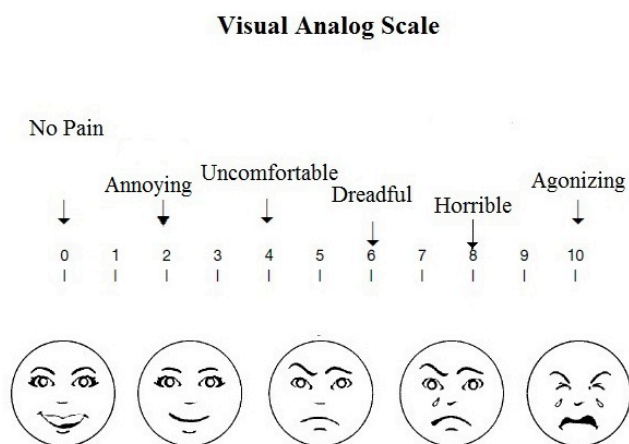


Figure 1. Visual Analog Scale

Post-operative pain management and analgesic drugs

Careful evaluation of pre- and post-surgical pain may lead to

more effective pain control and decreased morbidity and mortality [1]. Patients who have post-operative pain should be evaluated and medical and surgical reasons that may produce pain should be excluded. Treatment for pain should be regulated after assessing pain severity (Figure 2). Pain treatment should be started at preoperative period. During post-operative period patient's pain should be assessed at every 15 minutes, and then at 1-2 hour intervals. The patients should be assessed at every 4-8 hours after they are transferred to urology ward from anesthesiology recovery room and their treatments should be regulated. Various agents may be used for acute post-operative pain management.

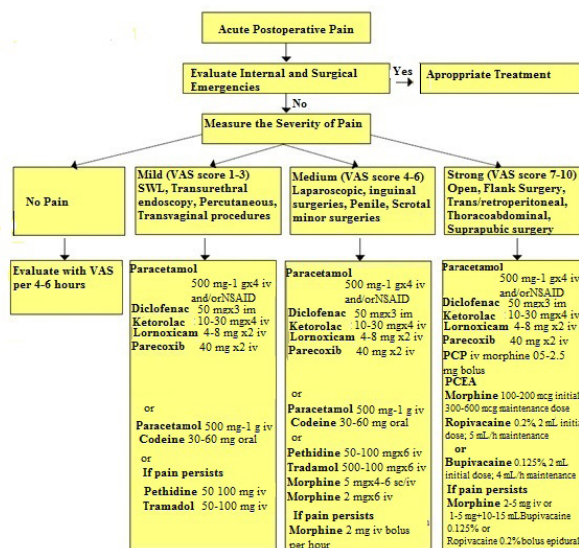


Figure 2. Postoperative pain management of urology

Non-steroidal Anti-inflammatory Drugs (NSAIDs)

NSAID's produce their effect by inhibiting cyclo-oxygenase system and prostaglandin production. They don't cause respiratory depression and they decrease opioid requirement [7,8]. But they are not effective for severe post-operative pain. They have adverse effects such as gastric ulcer, bronchospasm, thrombocyte dysfunction, perioperative hemorrhage, and inhibition of osteogenesis [9].

Paracetamol

Paracetamol (acetaminophen), is a safe and effective antipyretic and analgesic. They are used for mild-moderate pain. Use of paracetamol together with a strong opioid for severe pain after surgery decreases opioid consumption. Mechanism of action of this combination is not clear [10,11]. Paracetamol has no significant side effect. It should be used carefully in patients with chronic alcoholism or liver failure. It may cause renal failure when taken above 6g/day.

Opioids

Opioid agents are the first choice in severe acute post-operative pain. To minimize their side effects, they should be used at appropriate doses [12]. Opioids should be given at the lowest possible dose and their duration of use should be regulated. The best choice for this purpose is patient controlled analgesia (PCA) devices [13]. Morphine, fentanyl, and pethidine are the most common drugs used in PCA devices. Respiratory depression, apnea, sedation, nausea, vomiting, itching, constipation, and hypotension are main side effects of opioids.

Tramadol

Tramadol, is an agent with dual effect which has both opioid and non-opioid mechanisms of action. They are commonly used for treatment of acute and chronic pain. They are generally tolerated well although they have side effects like nausea, vomiting, sedation, dry mouth due to opioid component; and headache, lethargy, dry mouth and sweating due to monoaminergic component. It may be used by oral, rectal, or intravenous routes. The recommended dosage is 200-400 mg/day [14].

Adjuvant analgesics

Drugs that decrease pain despite primary goal of treatment with them is not pain relief are named as adjuvant analgesics, secondary analgesics, or co-analgesics. Drugs like ketamine, clonidine, gabapentin, and pregabalin belong to this group [6]. Pregabalin may be used peri-operatively. It decreases post-operative opioid requirement but it doesn't decrease the severity of post-operative pain [15]. Caudal block which may be done by using ketamine or clonidine in pediatric patients is very effective in pain control [16].

Methods of regional analgesia

Regional anesthesia methods are most effective for post-operative pain management [6]. Epidural analgesia provides effective post-operative analgesia after major surgeries and it decreases post-operative complications and opioid consumption [2]. Morphine, fentanyl, sufentanil, pethidine, and bupivacaine are the most common epidural analgesic agents. Local anesthetics and opioids may be used together for epidural analgesia. Continuous or intermittent nerve blocks may be used for post-operative analgesia after urological surgeries [17].

Methods of local analgesia

Bupivacaine and ropivacain are the most commonly used local anesthetic agents. Infiltration of local anesthetics to the incision region provides post-operative analgesia and decreases systemic analgesic requirement [18]. Direct application, not causing motor block by affecting only the surgical area, absence of mobilization inhibition and complications are main advantages.

Multimodal analgesia

Increasing analgesic effect by combining two different analgesic agents and method is named as multimodal analgesia. Frequently opioids, NSAID, and regional anesthesia methods are used together [6]. Therefore a more effective analgesia may be obtained.

Pain management after urological procedures

Shock wave lithotripsy

Analgesic treatment is not wanted by 33-59% of patients who had shock wave lithotripsy (SWL) for urinary stone disease either during or after the procedure [19,20]. Generally pain after SWL procedure is not severe and oral treatments are sufficient. Applying NSAID's 30-45 minutes before the procedure decreases opioid requirement after the procedure. Only 18% of the patients who were given 100 mg rectal diclofenac needed opioids after the procedure [21]. Also, pain requiring opioids was not seen in 70% of the patients who had midazolam and in 87% of the patients who had midazolam plus buprenorphine [22]. Giving midazolam, diclofenac, or tramadol to patients before the procedure is a safe and cheap method. Their side effects are

very rare compared with opioids and they may be used safely [23].

SWL is generally a painless procedure requiring low dose analgesics. If patient's pain is severe despite adequate treatment and lasts long, another underlying etiology should be investigated. Attention should be exercised not to overlook hydronephrosis and renal hematoma and clinical investigations should be performed to detect them.

Transurethral procedures

Spinal anesthesia before transurethral procedures provide effective analgesic treatment during intraoperative period and until post-operative 4-6 hours. Four to six hours before the procedure NSAID or paracetamol \pm codeine or strong opioids may be used orally. Anti-muscarinic agents are very effective for bladder pain due to urethral catheters and they decrease opioid requirement. Oxybutynin may be given orally, three times per day [24].

Percutaneous endoscopic procedures

NSAID or paracetamol \pm codeine or strong opioids may be given orally 4-6 hours after the procedure. Injection of 10 mL 0.25-0.5% bupivacaine to site of incision provides a very effective analgesia.

Laparoscopic and robotic procedures

Because these procedures are performed under general anesthesia, parenteral analgesia is given parenterally for 4-6 hours. After checking bowel motility treatment is given by oral route. The most common cause of pain in these procedures is irritation of diaphragm during pneumoperitoneum. Preventing diaphragm irritation by minimizing intraabdominal pressure is the most effective method to decrease pain [25].

Systemic opioids are given parenterally at early post-operative period to these patients. Later NSAID or paracetamol may be given. Local analgesic injection to cutaneous incision site provides a very effective analgesia and decreases opioid requirement of the patient [26].

Open surgical procedures

Oral analgesic treatment is generally enough after penis, scrotum, and inguinal region operations. If the operations are performed after local anesthesia, opioid treatment may be needed. Transvaginal procedures may be performed using general, regional, or local anesthesia. Treatment with paracetamol \pm NSAID is very effective.

For patients with perineal surgeries who has epidural catheters, opioid and local anesthetic combination should be applied by continuous infusion. Epidural anesthesia provides a very effective post-operative pain control. Complication rate decreases and patient's comfort increases [27]. If there is not an epidural catheter in place, this treatment should be given intravenous by PCA devices. If systemic opioids are needed, administration with an NSAID decreases required opioid dose. When the patient starts oral intake, treatment with paracetamol \pm codeine is initiated.

In trans-peritoneal surgeries, analgesic requirement of the patients may be minimized if abdominal region is protected and urinary drainage is established during and after the surgical procedure [28]. Combination of opioids and local anesthesia should be given to these patients by continuous infusion. When the patient starts oral intake, treatment with paracetamol \pm

codeine should be initiated.

For flank and thoraco-abdominal surgeries opioid and local anesthetic agent infusion with epidural catheter is more effective than intravenous analgesic treatment [29]. After the patient starts oral intake, the treatment should be similar to other situations.

Pain treatment in children

There is not a specific algorithm for treatment of pain in children [30]. The first step in pain management is assessment of pain severity. Pain evaluation is difficult in children because communication may be insufficient in children. There are different pain scoring scales for children developed according to age, cultural status, mental structure, communication skills, and physiologic reactions of children [31,32]. Among them Face, Legs, Activity, Cry, Consolability (FLACC) scale in which pain scoring can be done by standardized parameters may be an ideal scoring system [34] (Figure 3).

Criteria	Score - 0	Score - 1	Score - 2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disinterested	Frequent to constant quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid or jerking
Cry	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging or being talked to, distractible	Difficult to console or comfort

Figure 3. Face, Legs, Activity, Cry, Consolability (FLACC) scale

Pain management in children should include the families. To achieve an effective pain management clinician should be informed well at home or at hospital. Depending on physical and mental condition of the child family controlled analgesia may be performed [34].

Medications should be evaluated according to age, weight and medical status of the child and appropriate dose should be determined.

Drugs and Pain Management

Pre-emptive analgesia is prevention of pain by producing neural hypersensitization before the painful stimulus [35]. Administration of EMLA (2.5%lidocaine+2.5% prilocaine) cream before insertion of an IV line decreases pain due to the procedure [36]. Local anesthetic or NSAID application during surgery delays post-operative pain and amount of required analgesic.

Mainstay of post-operative pain management in children consists of regional or caudal block + intraoperative preemptive analgesia [37]. If pain continues at post-operative period despite them paracetamol+NSAID may be added. If the pain still persists first weak opioids (tramadol, codeine, etc) and then strong opioids (morphine, fentanyl, oxycodone, pethidine) may be administered (Figure 4). Opioids for children may be given by oral, mucosal, transdermal, subcutaneous, intramuscular, or intravenous routes [38].

Circumcision

Circumcision should be performed under general anesthesia in

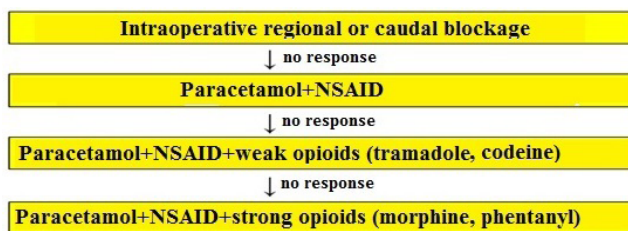


Figure 4. Postoperative pain management of children

all age groups [37]. At post-operative period appropriate pain management should be provided [39]. Analgesic procedures such as dorsal penile nerve block, ring block, or topical anesthesia (lidocaine, prilocaine) before surgery and choosing sensitive clamps (eg Mogen clamp) during procedure decrease pain [40,41]. Dorsal penile block is as effective as caudal block [42]. Before application of caudal block risk of affecting motor function and possible problems with urination should be told to the family.

Penile, inguinal and scrotal surgeries

Caudal block should be used for hypospadias surgeries. Caudal block, nerve block, and local anesthetics to area of surgical excision may provide sufficient post-operative pain management for inguinal and scrotal surgeries. Anticholinergics may be required for pain due to catheter related bladder spasms [37].

Bladder and kidney surgeries

Continuous epidural infusions or systemic iv treatments may be started to these patients [43,44]. Patient controlled analgesia may be applied in children ≥6 years. In younger children nurse controlled analgesia should be given [45].

Effective pain treatment is necessary for open kidney surgeries because 3 muscle layers are incised. Dorsal lumbotomy incision is the best alternative because it has potential analgesic effect. Patients who are operated with this incision stay shorter at hospital, begins earlier to oral intake, and their daily activities are less limited [46]. Spraying local anesthetics to intraperitoneal region before opening of perirenal fascia during laparoscopic kidney operations is beneficial for post-operative pain management [47].

Conclusion

Several alternatives exist in urological post-operative pain management. An effective urological post-operative pain management should be multidisciplinary. The most effective and the least harmful management should be chosen by sophisticated pain-control methods, post-operative pain should be minimized, patient satisfaction should be maximized, and progression to post-operative pain syndrome should be prevented.

Competing interests

The authors declare that they have no competing interests.

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